

Jedidiah McClurg

Curriculum Vitæ *

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Executive Summary

- **Research:** My research focuses on synthesis/verification of software-defined network (SDN) programs, and my overall goal is to develop tools and techniques to help programmers write better code. I have (co-)authored 11 peer-reviewed papers since 2012, including first-author conference papers at top venues like **CAV'17**, **PLDI'16**, and **PLDI'15**. My total citation count is currently 110, with an h-index of 5 and i10-index of 4. I received an Outstanding Research Award from the CU Boulder CS Department in Spring 2017.
- **Teaching:** Since 2007, I have served as an undergraduate/graduate teaching assistant 8 times. I received an Outstanding Teaching Assistant Award from CU Boulder CS in Fall 2013.
- **Service:** I served as an Artifact Evaluation Committee (AEC) member for POPL'18 and '16, and wrote reviews for IEEE ToN (2017), ESOP'17, TACAS'16, ASE'14, and CAV'14.

Education

- 2013 – 2018 **Ph.D. Computer Science**, University of Colorado Boulder, Boulder, CO, USA.
 - Research Group: CUPLV (Programming Languages and Verification)
 - Topic: *Program Synthesis for Software-Defined Networking*
 - Advisor: Prof. Pavol Černý
- 2011 – 2013 **M.S. Computer Science**, Northwestern University, Evanston, IL, USA.
- 2004 – 2009 **B.S.E. Electrical & Computer Eng.**, University of Iowa, Iowa City, IA, USA.

Awards

Sep 2017	ARCS Scholarship, ARCS Foundation Colorado	\$6500
Apr 2017	Outstanding Research Award, CS Dept., CU Boulder	\$600
Apr 2014	Outstanding Teaching Assistant Award, CS Dept., CU Boulder	\$500
Oct 2013	Research Community Development (RCD) Award, CU Boulder	\$1850
Aug '13 – Jul '14	Dean's Fellowship, University of Colorado Boulder	\$5000
Aug '13 – Jul '14	University Fellowship, University of Colorado Boulder	\$1000
Sep '11 – Aug '12	Walter P. Murphy Fellowship, Northwestern University	\$16K + tuition
May 2011	Innovation Disclosure, Rockwell Collins Advanced Tech. Center	\$600
Aug '04 – May '08	Presidential Scholarship, University of Iowa	\$28K + tuition
Aug '04 – May '08	National Merit Scholarship, University of Iowa	\$9500

Aug 2004	National Merit Scholarship, Rockwell Collins	\$2500
Aug 2004	Engineering Excellence Scholarship, University of Iowa	\$1000

Travel Grants

Jun 2017	Travel Grant, CAV Student Fellowship	\$2021
May 2016	Travel Grant, SIGPLAN, PLDI Conference	\$510
Feb 2016	CS/Dean's Travel Grant, University of Colorado Boulder	\$1300
Apr 2015	Travel Grant, NSF, PLDI/FCRC Conference	\$1028
Feb 2015	CS Travel Grant, University of Colorado Boulder	\$1000
Sep 2012	TGS Travel Grant, Northwestern University	\$500
Sep 2012	EECS Travel Grant, Northwestern University	\$300
May 2011	Travel Grant, NSF, Summer School on Formal Techniques at SRI	\$500

Academic Experience

University of Colorado Boulder, Boulder, CO, USA

- Jan '14 – present *Graduate Research Assistant.*
Working on research related to program synthesis for SDN.
- Aug '13 – Dec '13 *Graduate Teaching Assistant.*
Taught discussion section, created/graded exams, and held office hours for the *CSCI 3155 Principles of Programming Languages* class.

Northwestern University, Evanston, IL, USA

- Sep '11 – Jun '13 *Graduate Research Assistant.*
Worked on research related to PL for wireless Sensor Networks (WSN).
- Sep '12 – Mar '13 *Graduate Teaching Assistant.*
Assisted with grading, office hours, etc. for *EECS 317 Data Management and Information Processing*, and *EECS 211 Fundamentals of Computer Programming II*.

University of Iowa, Iowa City, IA, USA

- Jan '10 - Dec '10 *Graduate Research Assistant.*
Added wireless functionality to an embedded glucose sensor device (ECE Dept.). Wrote proof checker generator software, and a Lustre code translator (CS Dept.).
- Jan '10 - May '10 *Graduate Teaching Assistant.*
Provided general lab support and assisted the *055:089 EE Senior Design* class instructor with grading.
- Aug '07 – May '09 *Undergraduate Teaching Assistant, 3 semesters (Fall'07, Spring'08, Spring'09).*
Provided instruction and assistance to students in the lab, maintained/updated lab equipment, and graded lab reports and homeworks for the *055:032 Digital Design* (introduction to digital logic) class.
- Jan '06 – May '07 *Undergraduate Research Assistant, 3 semesters (Spring'06, Fall'06, Spring'07).*
Worked in the Dept. of Mathematics, designing and developing an interactive web-based Calculus learning tool for beginning undergraduates.

Jan '07 – May '07 *Undergraduate Teaching Assistant.*




Hosted weekly tutorial/discussion sessions with students, graded homeworks, wrote exam questions, and presented exam review sessions for the *059:006 Engineering Problem Solving II* (introduction to C programming) class.

Publications

📖 Conference Papers In Progress

- [12] Jedidiah McClurg, Nate Foster, and Pavol Cerny. Data-Plane Mechanisms for Distributed SDN Programming. 2017.

📖 Peer-reviewed Conference Papers

- CAV '17**  [11] Jedidiah McClurg, Hossein Hojjat, and Pavol Cerny. Synchronization Synthesis for Network Programs. In *the 29th Intl. Conference on Computer-Aided Verification*. Acceptance rate: **57 / 191 = 30%**. Heidelberg, Germany, 2017.
- FMCAD '16** [10] Hossein Hojjat, Philipp Ruemmer, Jedidiah McClurg, Pavol Cerny, and Nate Foster. Optimizing Horn Solvers for Network Repair. In *the 16th Intl. Conf. on Formal Methods in Computer-Aided Design*. Acceptance rate: **23 / 64 = 36%**. Mountain View, CA, USA, 2016.
- DISC '16** [9] Pavol Cerny, Nate Foster, Nilesh Jagnik, and Jedidiah McClurg. Optimal Consistent Network Updates in Polynomial Time. In *the 30th Intl. Symp. on Distrib. Computing*. Acceptance rate: **32 / 132 = 24%**. Paris, France, 2016.
- PLDI '16**  [8] Jedidiah McClurg, Hossein Hojjat, Nate Foster, and Pavol Cerny. Event-Driven Network Programming. In *the 37th ACM SIGPLAN Conference on Programming Language Design and Implementation*. Acceptance rate: **49 / 304 = 16%**. Santa Barbara, CA, USA, 2016.
- SecureComm'15** [7] Vaibhav Rastogi, Zhengyang Qu, Jedidiah McClurg, Yinzhi Cao, and Yan Chen. Uranine: Real-time Privacy Leakage Monitoring without System Modification for Android. In *the 11th EAI Intl. Conf. on Security and Privacy in Communication Networks*. Acceptance rate: **30 / 108 = 28%**. Dallas, TX, USA, 2015.
- PLDI '15**  [6] Jedidiah McClurg, Hossein Hojjat, Pavol Cerny, and Nate Foster. Efficient Synthesis of Network Updates. In *the 36th ACM SIGPLAN Conf. on Programming Language Design and Implementation*. Acceptance rate: **58 / 303 = 19%**. Portland, OR, USA, 2015.
- ### 📖 Peer-reviewed Workshop/Demo Papers
- MobileDeLi '15** [5] J. Protzenko, S. Burckhardt, M. Moskal, and Jedidiah McClurg. Implementing Real-time Collaboration in TouchDevelop using AST Merges. In *the 3rd Intl. Workshop on Mobile Dev. Lifecycle*. Pittsburgh, PA, USA, 2015.

- PLVNET '15** [4] Hossein Hojjat, Jedidiah McClurg, Pavol Cerny, and Nate Foster. Network Updates for the Impatient: Eliminating Unnecessary Waits. In *the 1st Workshop on Programming Languages and Verification Technology for Networking*. Mumbai, India, 2015.
- ACL2 '14** [3] David S Hardin, Jennifer A Davis, David A Greve, and Jedidiah R McClurg. Development of a Translator from LLVM to ACL2. In *the 12th International Workshop on the ACL2 Theorem Prover*. Vienna, Austria, 2014.
- LAW '13** [2] Jennifer Davis, David Hardin, and Jedidiah McClurg. Creating Formally Verified Components for Layered Assurance with an LLVM-to-ACL2 Translator. In *the 7th Layered Assurance Workshop*. New Orleans, LA, USA, 2013.
- Sensys '12** [1] Jedidiah McClurg, Goce Trajcevski, and Jesse Yanutola. Demo Abstract: Collaborative Reactive Behavior in Heterogeneous Wireless Sensor Networks. In *the 10th ACM Conference on Embedded Networked Sensor Systems*. Toronto, ON, Canada, 2012.

Talks

- Jul 27, 2017 CAV 2017
 Jun 30, 2017 CU Boulder, CUPLV Group

• Synchronization Synthesis for Network Programs
Heidelberg, Germany
Boulder, CO, USA
- Jun 16, 2016 PLDI 2016
 May 27, 2016 CU Boulder, CUPLV Group

• Event-Driven Network Programming
Santa Barbara, CA, USA
Boulder, CO, USA
- Jun 16, 2015 PLDI 2015
 Jun 5, 2015 CU Boulder, CUPLV Group
 Mar 6, 2015 (with Pavol Černý) CU Boulder, NGN Group

• Efficient Synthesis of Network Updates
Portland, OR, USA
Boulder, CO, USA
Boulder, CO, USA
- June 25, 2014 Microsoft Research, RiSE Group

• AST-based Collaborative Editing
Redmond, WA, USA
- Aug 8, 2013 Rockwell Collins, Advanced Technology Center

• Reasoning About LLVM Assembly Code via .LL-to-ACL2 Translation
Cedar Rapids, IA, USA
- May 30, 2012 Northwestern EECS 441 Class Final Presentation

• Virtual Machine Support for Parallel Language Runtimes
Evanston, IL, USA
- May 28, 2012 (with J. Friedman and W. Ng) Northwestern EECS 450

• Detecting Android Privacy Leaks via Dynamic Taint Analysis
Evanston, IL, USA
- Jun 14, 2011 (with Lucas Wagner) AFRL S5 Symposium

• Industrial Verification Using the KIND Model Checker
Dayton, OH, USA

Academic Service

- **Artifact Evaluation Committee (AEC) Member:** POPL '18, POPL '16
- **Reviewer:** IEEE Transactions on Networking (ToN) '17, ESOP '17, TACAS '16, CAV '14, ASE '14

Skills

desktop environments	Ubuntu (Linux), Solaris, Windows, Cygwin
embedded platforms	Android, SunSPOT, TelosB, Microchip, Freescale
programming langs.	OCaml, Scala, Java, C, C++, Perl, Python, SML, Racket
formal verification	Z3, Yices, SPIN, NuSMV, MiniSat, ACL2, HOL, Lustre, Alloy
compiler construction	Xtext, OCamlLex/Yacc, LLVM, X86
hardware design	VHDL, Verilog, Xilinx, PSpice, I ² C, SPI, SD/MMC, USB
networking	nesC, TinyOS, Sockets, TCP/IP, ZigBee (802.15)
web development	PHP, MySQL, HTML, CSS, JavaScript, Apache, JSP, Tomcat
mathematical tools	Mathematica, MATLAB, L ^A T _E X, Gnuplot

Professional Experience

Microsoft Research, Redmond, WA, USA

Mar '14 – Jun '14 *Research Intern.*
Worked in the RiSE group, building support for realtime collaborative code-editing into the TouchDevelop project.

Rockwell Collins, Cedar Rapids, IA, USA

Jun '13 – Aug '13 *Graduate Intern.*
Worked in the Advanced Technology Center building a translator from LLVM assembly code into ACL2 to facilitate reasoning about binaries.

Jan '11 – Aug '11 *Graduate Intern.*
Worked in the Advanced Technology Center developing and using verification tools in an avionics context.

Nov '09 – Jun '10 *Graduate Co-op.*
Worked in the SATCOM department developing test software for a military satellite terminal waveform and writing various scripts and documentation.

Sep '08 – Dec '08 *Engineering Co-op.*
Worked in the Panels department designing hardware/software for commercial airliner cockpit panels and designing/configuring panel test equipment.

Jun '04 – Aug '04 *Technical Intern.*
Worked in the Advanced Technology Center developing GUI frontends related to testing and benchmarking of a software-defined radio.

aJile Systems, Cedar Rapids, IA, USA

June 2002 - August 2002 *Technical Intern.*
Developed benchmark applications for a JAVA bytecode processor.

Miscellaneous

memberships Association for Computing Machinery (ACM)
citizenship United States
relationship status married (spouse is self-employed in the apparel design industry)
Erdős number ≤ 4
typing speed 80 wpm
StackOverflow level 3500+ reputation, 19 badges (member since Aug 2012)
AskUbuntu level 450+ reputation, 7 badges (member since Aug 2012)
hobbies hiking, rock climbing, unicycling

References

Professional references available on request